

REMARKS

The Office Action dated February 26, 2003, has been received and reviewed.

Claims 1-7, 9-24, and 26-40 are currently pending and under consideration in the above-referenced application. Claims 8 and 25 were previously canceled without prejudice or disclaimer.

Each of claims 1-7, 9-24, and 26-40 stands rejected.

New claims 41-44 have been added.

Reconsideration of the above-referenced application is respectfully requested.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-7 and 9-16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,232,667 to Hultmark et al. (hereinafter "Hultmark"). It is presumed that the Office intended to reject each of these claims under 35 U.S.C. § 102(e) rather than under § 102(b), as Hultmark did not issue until after the priority date for the above-referenced application.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Additionally, the elements must be arranged as required by the claim, but identity of the terminology is not required. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

Hultmark describes a method for assembling semiconductor devices that includes providing a first semiconductor die 26 and flip-chip bonding a second semiconductor die 30 to the first semiconductor die (FIG. 2A), with some of the bond pads 31 of the first semiconductor die 26 being exposed laterally beyond an outer periphery of the second semiconductor die 30. The exposed bond pads 31 of the first semiconductor die 30 are then flip-chip attached to corresponding contacts or terminals 33 of a carrier 20 (FIG. 1).

Independent claim 1, as amended and presented herein, recites a method that includes, among other things, providing a first semiconductor die and at least one second semiconductor

die. At least one of the first and at least one second semiconductor dice includes bond pads that are recessed relative to a surface thereof. Upon orientation and electrical connection of the first and at least one second semiconductor dice, the recessed bond pads at least partially receive conductive structures for connection to corresponding bond pads, thereby facilitating alignment of the recessed bond pads and the corresponding bond pads.

As Hultmark lacks any express or inherent description that either of the semiconductor dice thereof may include recessed bond pads, it is respectfully submitted that Hultmark does not anticipate each and every element of amended independent claim 1. It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(b), amended independent claim 1 is allowable over Hultmark.

Claims 2-7 and 9-16 are each allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Claim 3 is further allowable since Hultmark does not expressly or inherently describe that the first semiconductor die 26 thereof comprises a logic device and the second semiconductor die 30 thereof comprises a memory device.

For these reasons, it is respectfully requested that the 35 U.S.C. § 102(e) rejections of claims 1-7 and 9-16 be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 17-24 and 26-40 stand rejected under 35 U.S.C. § 103(a).

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaack*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Hultmark in View of Buckley

Claims 17-24 and 26-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hultmark, as applied to claim 1 above and, further, in view of U.S. Patent 5,477,082 to Buckley, III et al. (hereinafter "Buckley").

The multi-chip module shown in FIG. 4 of Buckley includes two semiconductor device components 56 and 58 that are electrically connected to one another by way of an intervening flexible carrier 60. Solder bumps 66 and 72 are secured to the bond pads 64 and 68 of semiconductor device components 56 and 58, respectively. The solder bumps 66 and 72 are respectively secured to pads 76 and 74 that communicate with one another and which are located on opposite surfaces of the flexible carrier 60.

Each of claims 17-22 is allowable, among other reasons, as depending either directly or indirectly from claim 1, which is allowable.

Additionally, claim 19 is allowable because neither Hultmark nor Buckley teaches or suggests that first members of conductive elements that are secured to bond pads of a first semiconductor die may be directly secured to second members of the conductive elements, which are secured to bond pads of a second semiconductor die. Instead, the teachings of Buckley are quite clearly limited to solder bumps 66 and 72 that are indirectly secured to one another by way of intervening pads 76 and 74.

Independent claim 23, as amended and presented herein, recites a method for packaging a semiconductor device assembly. The method of amended independent claim 23 includes, among other things, providing a first semiconductor die and at least one second semiconductor die. At least one of the first and the at least one second semiconductor dice includes a plurality of bond pads that are recessed relative to an active surface thereof. Such recessing of the bond pads facilitates subsequent alignment of corresponding bond pads of the first and at least one second semiconductor dice.

As neither Hultmark nor Buckley teaches or suggests a method which includes providing at least one semiconductor die with bond pads that are recessed relative to an active surface thereof, it is respectfully submitted that a *prima facie* case of obviousness cannot be established

against amended independent claim 23 based merely on the teachings Hultmark and Buckley, taken either together or separately. Therefore, it is respectfully submitted that, under 35 U.S.C. § 103(a), amended independent claim 23 is allowable over Hultmark and Buckley.

Each of claims 24 and 26-38 is allowable, among other reasons, as depending either directly or indirectly from claim 23, which is allowable.

Claim 32 is further allowable since neither Hultmark nor Buckley teaches or suggests “providing a plurality of leads . . .”

Claim 35 is also allowable because neither Hultmark nor Buckley teaches or suggests that first members of conductive elements that are secured to bond pads of a first semiconductor die may be directly secured to second members of the conductive elements, which are secured to bond pads of a second semiconductor die. Instead, the teachings of Buckley are quite clearly limited to solder bumps 66 and 72 that are indirectly secured to one another by way of intervening pads 76 and 74.

Hultmark et al. in View of Yu et al.

Claims 39 and 40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hultmark in view of U.S. Patent 6,100,593 to Yu et al. (hereinafter “Yu”).

Yu teaches packaging techniques that include flip-chip connecting semiconductor dice to one another and placing assemblies of such dice within receptacles of carrier substrates.

Yu does not teach or suggest that the dice that are used in such packaging techniques may include recessed bond pads. Accordingly, it is respectfully submitted that neither Hultmark, for the same reasons provided above, nor Yu, teaches or suggests providing a multi-chip module that includes a first semiconductor die and at least one second semiconductor die, with at least one of the dice including bond pads that are recessed, as is recited in independent claim 39, as amended and presented herein.

It is, therefore, respectfully submitted that a *prima facie* case of obviousness has not been established against amended independent claim 39, as is required to maintain a claim rejection under 35 U.S.C. § 103(a). Accordingly, under 35 U.S.C. § 103(a), amended independent claim 39 is allowable over the combination of Hultmark and Yu.

Claim 40 is allowable, among other reasons, as depending from claim 39, which is allowable.

In view of the foregoing, withdrawal of the 35 U.S.C. § 103(a) rejections of claims 17-24 and 26-40 is respectfully requested.

New Claims

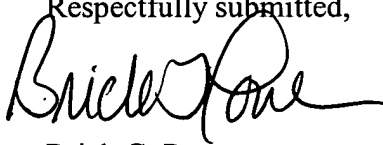
New claims 41-44 have been added. New claims 41 and 42 both depend from claim 1, while new claims 43 and 44 depend from claim 39. It is respectfully submitted that none of new claims 41-44 introduces new matter into the above-referenced application.

The consideration and allowance of new claims 41-44 is respectfully requested.

CONCLUSION

It is respectfully submitted that each of claims 1-7, 9-24, and 26-44 is allowable. An early notice of the allowabilty of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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